## Amendments to the Claims

1. (Original) A sputter reactor, comprising:

a vacuum chamber including sidewalls extending generally parallel to a central axis of said vacuum chamber;

a target comprising at least a surface composed of a magnetizable material and configured to be connected to a power supply for creating a plasma within said vacuum chamber;

a pedestal in opposition to said target for supporting on a support surface thereof a substrate to be sputter coated within said vacuum chamber; and

a magnetic dipole ring included inside of said sidewalls and outside of said support surface and having an axial extent along said central axis including a plane passing through said pedestal.

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2. (Original) The sputter reactor of Claim 1, wherein said magnetic dipole ring includes at least eight permanently magnetized magnets arranged around said central axis and having respective magnetization directions lying perpendicular to said central axis and precessing by 720° around said dipole ring.

3. (Original) The sputter reactor of Claim 1, further comprising a vacuum tight carrier encapsulating said dipole ring.

4. (Original) The sputter reactor of Claim 1, further comprising a cover ring supportable on a periphery of said pedestal and detachably engageable with said dipole ring.

5. (Original) The sputter reactor of Claim 1, further comprising an annular shield protecting said sidewalls from sputter deposition, wherein said dipole ring is disposed between

said shield and said sidewalls.

6. (Original) The sputter reactor of Claim 5, wherein said dipole ring is supported on projections extending inwardly from said sidewall.

7. (Original) The sputter reactor of Claim 5, wherein said dipole ring is detachably engageable with said shield.

8. (Original) The sputter reactor of Claim 7, wherein said shield includes a recess at least partially accommodating said dipole ring.

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9. (Original) A sputter reactor, comprising:

a vacuum chamber including sidewalls extending generally parallel to a central axis of said vacuum chamber;

a target comprising at least a surface composed of a magnetizable material and configured to be connected to a power supply for creating a plasma within said vacuum chamber;

a pedestal in opposition to said target for supporting on a support surface thereof a substrate to be sputter coated within said vacuum chamber; and

a magnetic layer disposed in said pedestal adjacent said support surface and substantially uniformly magnetized in a predetermined direction extending along said support surface.

10. (Original) A magnetron sputter reactor, comprising:

a vacuum chamber having sidewalls and sealable at one end by a target to be sputtered, thereby forming therein a processing space;

a magnetron disposed on a side of said target opposite said processing space and rotatable about a central axis of said chamber;

a pedestal for supporting on a support surface in opposition to said target a substrate to be

sputter coated, said pedestal being separated from said target by a throw that is at least 75% of a diameter of said substrate;

a grounded shield disposed inside said sidewalls around said processing space;

a grounded collimator disposed in said processing space inside said shield between said target and said support surface; and

a magnetic ring positioned around said pedestal and creating a magnetic field perpendicular to said central axis in a plane of said support surface.

11. (Original) The reactor of Claim 10, wherein said magnetic ring is a magnetic dipole ring.

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12. (Original) The reactor of Claim 10, wherein said magnetic ring is disposed between said pedestal and said sidewalls.

13. (Original) The reactor of Claim 10, wherein said target has at least a surface portion formed of a magnetizable material.

14. (Previously presented) The reactor of Claim 10, wherein said magnetron comprises an inner magnetic pole of a first magnetic polarity along said central axis and a surrounding outer magnetic pole of a second magnetic polarity opposite said first magnetic polarity.

15. (Original) The reactor of Claim 14, wherein a total magnetic intensity of said outer magnetic pole is at least 50% larger than a total magnetic intensity of said inner magnetic pole.

16. (Original) A method of sputtering a magnetic material in a sputter reactor processing vacuum chamber having a target comprising a magnetizable material in opposition to a substrate support surface in said chamber, comprising the steps of:

placing in an interior of said vacuum chamber a magnetic dipole ring producing a substantially uniform magnetic field in a first direction along said substrate support surface;

placing a substrate on said support surface with a second direction of said substrate intended to conform to a desired magnetic direction to be aligned with said first direction; and

exciting a plasma in said chamber to sputter said target and coat a surface of said substrate with said magnetic material.

17. (Presently amended) ~~The method of Claim 16~~ A method of sputtering a magnetic material in a sputter reactor processing vacuum chamber having a target comprising a magnetizable material in opposition to a substrate support surface in said chamber, comprising the steps of:

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placing in an interior of said vacuum chamber a magnetic dipole ring producing a substantially uniform magnetic field in a first direction along said substrate support surface, wherein said magnetic dipole ring comprises a plurality of at least eight permanent ~~permanently~~ magnets arranged in a circle with respective magnetization directions precessing by 720° around said circle;

placing a substrate on said support surface with a second direction of said substrate intended to conform to a desired magnetic direction to be aligned with said first direction; and

exciting a plasma in said chamber to sputter said target and coat a surface of said substrate with said magnetic material.

18. (Original) The method of Claim 16, wherein said substrate support surface is electrically floating.

19. (Original) A method of depositing a magnetic material with a preferred alignment on a substrate, comprising the steps of:

providing around a substrate support surface within a deposition chamber a magnetic

dipole ring producing a substantially uniform magnetic field in a first direction along said substrate support surface;

placing a substrate on said substrate support surface with a predetermined direction of said substrate aligned with said first direction of said chamber; and

depositing a magnetizable material onto said substrate placed on said substrate support surface.

20. (Original) The method of Claim 19, wherein said depositing step comprises sputtering a target comprising said magnetizable material.

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21. (Original) The method of Claim 19, wherein said depositing step comprises chemical vapor deposition.

22 – 24. (Canceled)

25. (Original) A magnetic dipole ring assembly, comprising:

at least eight permanently magnetized magnets arranged in a ring around a central axis and having respective magnetization directions lying perpendicular to said central axis and precessing by 720° around said ring; and

an annular vacuum-tight carrier encapsulating said magnets.

26. (Presently amended) ~~The assembly of Claim 25~~ A magnetic dipole ring assembly, comprising:

at least eight permanently magnetized magnets arranged in a ring around a central axis and having respective magnetization directions lying perpendicular to said central axis and precessing by 720° around said ring, wherein said magnets have a Curie temperature of at least 200°C; and

an annular vacuum-tight carrier encapsulating said magnets.

27. (Original) The assembly of Claim 25, wherein said carrier comprises stainless steel.

28. (Original) The assembly of Claim 27, wherein said stainless steel is non-magnetic.

29. (Original) The assembly of Claim 25, wherein said magnets comprises samarium and cobalt.

30. (Presently amended) A cover and dipole ring assembly for use in a plasma deposition reactor having a pedestal for supporting on a support surface thereof a substrate to be coated, comprising:

a cover ring supportable on [[a]] said pedestal and thereby protecting a portion of said pedestal from deposition; and

a magnetic dipole ring detachably supported on said cover ring.

31. (Original) The assembly of Claim 30, wherein said magnetic dipole ring comprises at least eight permanently magnetized magnets arranged in a circle around a central axis and having respective magnetization directions lying perpendicular to said central axis and precessing by 720° around said circle.

32. (Presently amended) The sputter reactor of Claim 1, further comprising an annular cover ring, comprising:

an annular roof portion covering a periphery of said pedestal and extending radially outwardly from said pedestal;

an annular first projection extending downwardly from said roof portion along a side of said pedestal;

an annular second projection extending downward from said roof portion radially outside of said first projection, a downwardly facing vault formed by said roof portion and said first and second projections to accommodate therein said magnetic dipole ring; and

at least three attachments formed in said second projection detachably mounting said magnetic ring within said vault.

33. (Previously presented) The sputter reactor of Claim 32, wherein said magnetic dipole ring creates a substantially uniform horizontal magnetic field on said support surface.

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34. (Previously presented) The sputter reactor of Claim 32, wherein said first projection has a sloped sidewall centering said cover ring on said pedestal.

35. (Previously presented) The sputter reactor of Claim 32, wherein said at least three attachments each comprise a hook-shaped slot formed at a bottom of said second projection removably receiving horizontally extending tabs on said magnetic dipole ring.

36. (Previously presented) The sputter reactor of Claim 1, further comprising a sputter shield, comprising:

an annular outer wall having at least an annular first wall portion extending along said central axis and including attachments for detachably engaging said magnetic dipole ring fittable between said outer wall and said sidewalls;

an annular bottom wall connected to said outer wall and extending perpendicular to said central axis; and

an annular inner wall connected to said bottom wall, disposed within said first portion of said outer wall, extending along said central axis, and having a terminating end.

37. (Presently amended) The sputter reactor of Claim 36, wherein said first wall portion

of said outer wall has a first diameter and is connected to said bottom wall and further comprises:

an annular ledge extending perpendicular to said central axis and connected to said first portion; and

an annular second wall portion extending parallel to said central axis and having a second diameter larger than said first diameter;

wherein said ledge and said first wall portion include ~~includes~~ said attachments and at least partially accommodates said magnetic dipole ring.

38. (New) The method of Claim 16, wherein said magnetic dipole ring is stationary while said plasma is excited, whereby said produced magnetic field is stationary.

39. (New) A magnetic dipole ring assembly, comprising:

at least eight permanently magnetized magnets having a Curie temperature of at least 200°C and arranged in a ring around a central axis and having respective magnetization directions lying perpendicular to said central axis and precessing by 720° around said ring.

40. (New) The dipole ring assembly of Claim 39, wherein said Curie temperature is at least 500°C.

41. (New) The dipole magnet ring assembly of Claim 39, whereby said magnets remain magnetized through a vacuum bake out at a temperature of at least 200°C.

42. (New) The dipole magnet ring assembly of Claim 39, wherein said magnets comprise SmCo.